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POPULATION DYNAMICS OF THE UNITED STATES AND THE UNION OF SOVIET SOCIALIST REPUBLICS

Report submitted by the United States Bureau of the Census 1/ 2/

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2/ The designations employed, the presentation of material and the views expressed in this paper are the views of the authors and do not necessarily reflect the views of the Secretariat of the United Nations in any of these respects.

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Introduction

Between 1989 and 1990, there will be an 8 percent reduction in the number of 18-year-olds in the United States. And this cohort will not return to its 1989 size until 2001. In the Soviet Union, the 18-year-old cohort began decreasing in 1978 and will not regain its former size until 2002. These decreases are symbolic of more complicated changes in the population structures of both countries in the next 20 years.

Between 1970 and the year 2000, in both countries, the rate of population growth is slowing; the rate of labor force growth is slowing even more. And age, racial, and ethnic proportions in both populations are changing. The Soviet Union and the United States are the third and fourth most populous countries in the world, respectively. Changes in their populations are likely to have not only short-term impacts within the labor forces of the two countries, but also longer-term impacts on their neighbors and allies.

Definitions, Sources, and Reliability of the Projections

The U.S. population and labor force estimates and projections come from the Bureau of the Census and the Bureau of Labor Statistics [1-4]. The Soviet projections are made by the Bureau of the Census using data from Soviet censuses and labor force surveys [5-10]. A statistical glasnost' is providing much more and better-quality data from the Soviet Union than in the past. The projections of populations and labor forces are based on substantive judgments about potential developments. Fertility usually is the most important factor in determining the size and structure of future populations and also is the major source of uncertainty in most population projections. The major source of uncertainty in labor force projections for the next 20 years is the labor force participation rates of the working-age cohorts, which already have been born.

National statistics for the United States and Soviet Union do not capture the heterogeneity of both populations; but they also do not reflect the fundamental differences in

the heterogeneity between the two countries. Virtually everyone in the United States speaks English; Russian speakers are a minority in many Soviet Republics. Moreover, the total fertility rates (TFRs) of ethnic groups vary much more in the Soviet Union than in the United States. In 1988, fertility in the United States varied from a TFR of 1.7 among White women to a level of 2.7 among Hispanics. This is approximately the range of variation among the European and Caucasian ethnic groups of the Soviet Union. But their fertility rate is half that of the Central Asian nationalities. Ethnic, racial, and gender differences within the United States and Soviet Union often are greater than the national differences between the two countries. Therefore, national projections provide only a partial description of important future population trends.

The nature of all projections means that they should be treated as broad indicators rather than precise estimates of the future [11,12]. But with that qualification, projections are important tools in anticipating the future. And realistic assessments of the future can help societies minimize the disruption of rapid changes in population trends.

Demographic Pasts and Consequences

Present populations are the accumulated interactions of demographic factors over time. The most important demographic event for the United States was the baby boom and bust following World War II; in the Soviet Union, the decimation of numerous cohorts in the collectivization, purges, and two World Wars played an even more important demographic role. Both demographic histories produced population waves that are echoed in subsequent generations. The amplitude of these waves, however, is greater for the Soviet Union than for the United States (Figure 1, A and B).

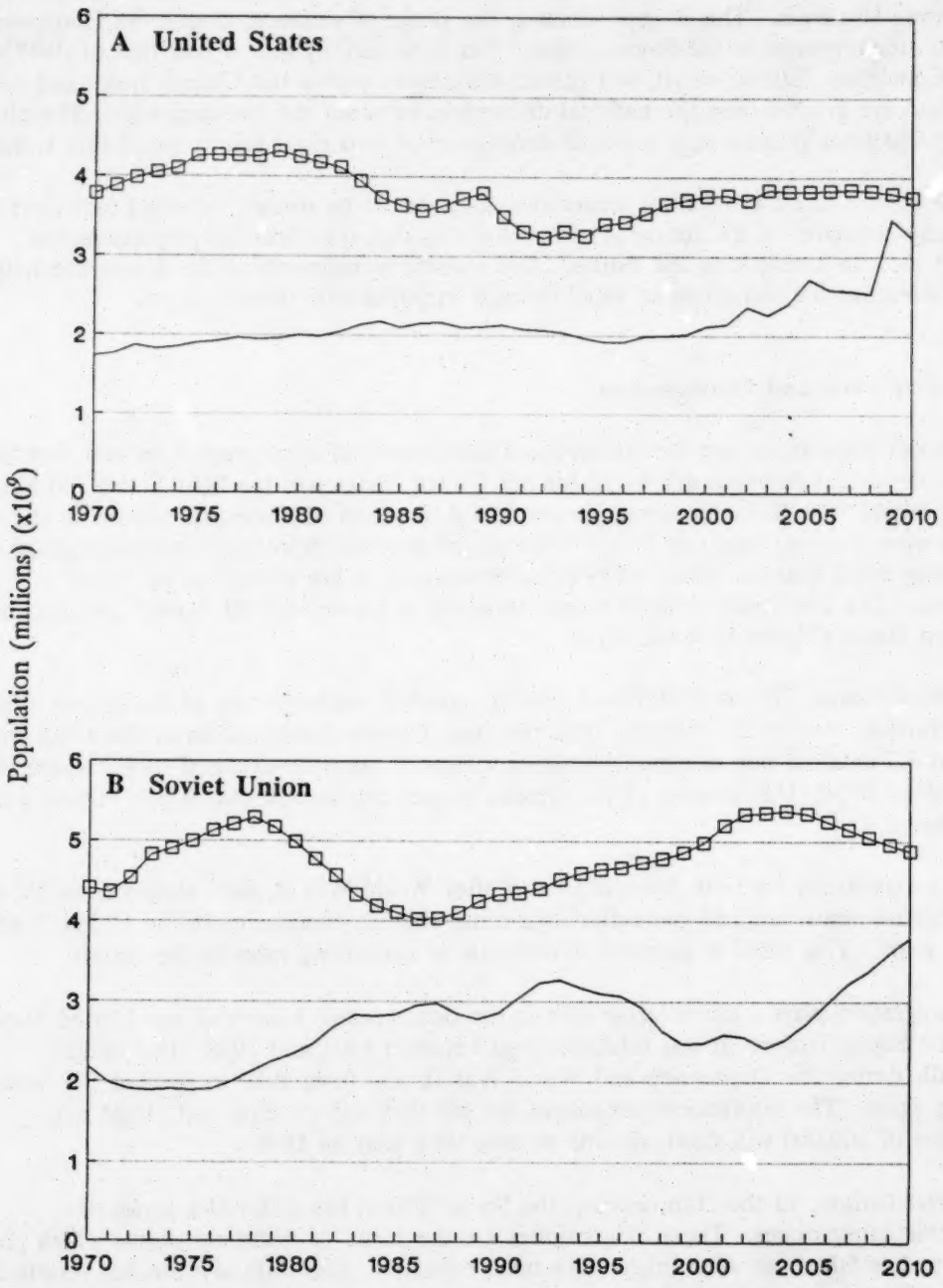
United States. The end of World War II signalled the beginning of the largest rise in the total fertility rate in U.S. history. The rise from the low fertility rates in the 1930s peaked in 1957 at 3.7 children per woman. And from this peak, the rate declined to 1.8 where it has hovered since 1974. U.S. Bureau of the Census projections assume that it will remain near 1.8 in the future.

Life expectancy for both sexes improved after World War II, then stalled from 1954 to 1968. Improvements resumed thereafter, and today the life expectancy in the United States is about 76 years. This trend is assumed to continue at decreasing rates in the future.

Immigration plays a much larger role in the demographic history of the United States than in the Soviet Union. It was relatively high between 1901 and 1930. It declined dramatically during the Depression and World War II, and from 1950 to present has been increasing again. The population projections assume that today's legal and illegal net immigration of 800,000 will slowly decline to 600,000 a year by 1998.

Soviet Union. In the 20th century, the Soviet Union has suffered a series of demographic catastrophes. These catastrophes are the result of historical events which produce population shortfalls from what might have been expected. Shortfalls are the net results of unexpected increases in deaths, decreases in fertility, and net-migration. An estimated shortfall of 27 to 28 million persons from the first census in 1897 to 1926 primarily was caused by the

Figure 1. POPULATION WAVES IN THE UNITED STATES AND SOVIET UNION
(A) Number of 18-year-olds (-□-) and persons reaching pension age (62 years) (—) in the United States [1,2,3]. (B) Number of 18-year-olds (-□-) and persons reaching pension age (55 years for women; 60 years for men) (—) in the Soviet Union [5,8].



first World War and the subsequent civil war and resulting famine [13]. Estimated population shortfalls during the period of collectivization of agriculture from 1926-1939 vary widely, but the most credible estimates are from 13 to 15 million person [14,15].

The Soviet Union lost an estimated 35 to 40 million people due to World War II: 11 to 13 million in the armed forces, 4 to 7 million civilian deaths related to direct military operations, and 20 million deaths attributed to the disruption of war [16]. This estimate was made by the leading Soviet historical demographer, Viktor Kozlov. An earlier estimate of 20 million deaths has been cited widely in the Soviet and Western literatures. But according to Kozlov, this estimate by the Stalin administration concealed the true magnitude of the war's impact. The World War II population shortfall represented 21 percent of the 1940 Soviet population and the loss was disproportionately male. As a result, the Soviet Union labor force was the only one in the post-World War II world that had more women than men until 1984.

Unlike the United States, the Soviet Union did not experience a baby boom or bust in the aftermath of World War II. After the war, Soviet fertility rose, but to a level that was lower than pre-World War II rates and considerably lower than the U.S. peak (total fertility rates of 2.8 and 3.7, respectively). By 1970, the fertility rates in both countries were almost the same, but the Soviet Union increased slightly while the United States has fallen to 1.8. After the adoption in 1981 of a series of incentives to stimulate childbearing, the level of Soviet fertility rose from 2.3 to 2.6 in 1986 but is projected to be lower today.

In both countries, the majority ethnic groups have had considerably lower fertility than minority groups. As a result, white Americans are projected to decline from 87 percent of all U.S. 18-year-olds in 1970 to 78 percent in 2010. In the Soviet Union, the 18-year-old ethnic Russians, who were a majority of their cohort in 1970, are 47 percent of 18-year-olds today and are expected to be 41 percent by the year 2010.

Officially reported life expectancies in the Soviet Union and the United States were only 1 year apart in 1970. But life expectancy in the Soviet Union are estimated to have declined in the 1970s to 68 years while it improved in the United States to 74 years. In 1985, the death rate of 0 to 5-year-olds in the Soviet Union was almost three times higher than in the United States; the death rate of Soviet men aged 30 to 54 years is twice as high as in the United States. Differences in accident mortality were even more pronounced, with the rates for Soviet men and women double and triple the corresponding U.S. levels [17]. Today, the gap in life expectancy between the Soviet Union and the United States is closing but is probably still over 5 years. This gap between the estimates is similar to the differences between whites and blacks in the United States, but smaller than the gap between U.S. men and women.

Despite different demographic histories, the U.S. and Soviet population growth rates are projected to slow in the 1990s to the same average annual rate of 0.7 percent (Table 1). This rate is 30 percent less than in the 1980s in the United States and 22 percent less in the Soviet Union. Low rates of population growth are projected to continue into the 21st century. Slowing population growth has a number of effects on societies, some of which can be anticipated.

Table 1. Population trends for the United States [1-3] and the Soviet Union [5-7]. (Total fertility rate is children per woman, U.S. pension age is 62 years, and Soviet pension age is 55 years for women and 60 years for men.)

		Estimated		Projected		
Variable	Country	1970	1980	1990	2000	2010
Total population ($x10^3$)	US	205.0	227.8	250.4	268.3	282.6
	USSR	242.8	266.4	290.2	311.6	334.0
Average annual growth rate (%)	US	1.1		1.0	0.7	0.5
	USSR	0.9		0.9	0.7	0.7
Total fertility rate	US	2.4	1.8	1.9	1.9	1.8
	USSR	2.4	2.3	2.4	2.3	2.2
Life expectancy at birth (years)	US	70.8	73.7	75.6	76.9	77.8
	USSR	69.5	67.5	69.8	72.9	75.7
18-year-olds						
White (%)	US	86.5	83.6	80.2	78.7	77.7
Russian (%)	USSR	55.4	46.7	47.0	44.2	40.5
Percent of population 65 years and over as a percent of total population	US	9.8	11.3	12.6	13.0	13.9
	USSR	7.9	9.6	9.4	11.5	11.8
Pension-age population as percent of total population	US	12.2	13.9	15.1	15.3	17.2
	USSR	15.1	15.5	17.3	18.8	19.1

The Effects of Slowing Population Growth

Aging. Slowing population growth because of declining fertility usually is accompanied by aging of populations; improvements in mortality of the elderly reinforce the trend. In the future, people of pension age and people 65 years and over are projected to increase as a percent of the population in both countries. (Official pension ages in the Soviet Union are 55 years for women and 60 years for men; in the United States, the social security early retirement age is 62 years.) In fact, the Soviet Union, which has been demographically much younger than the United States in the past, is projected to be one of the fastest aging countries in the world in the 1990s.

U.S. retirees increased rapidly as a percent of U.S. population in the 1970s and 1980s; but will grow relatively more slowly in the next 20 years. The Soviet Union, however, will be facing a continuing demographic wave of aging in the 1990s. The people retiring in the Soviet Union in the 1990s are those born in the relatively high fertility years of the 1930s; they were too young to fight in World War II but strong enough to survive it. The number of new Soviet pensioners will increase in the early 1990s and then subside in the late 1990s. The population age 65 years and over in the Soviet Union will increase in the 1990s from 9.4 percent to 11.5 percent of the total population, an increase that is one of the highest in the world.

In both the United States and the Soviet Union, retirees have low labor force participation rates relative to the rest of the population and, therefore, as the aged increase relative to the adult population, labor force growth is likely to slow also. In 1987, 16 percent of U.S. men and 7 percent of U.S. women age 65 years and over were in the labor force. In the Soviet Union, the same age groups have participation rates three times the U.S. rate (47.0 percent and 24.0 percent, respectively). But much of the labor of the Soviet pensioners is in the private subsidiary economy. Participation rates of the aged in both countries have been decreasing over time.

The changing of the retirement age can significantly change their labor force participation rates, amount of public resources the elderly absorb, as well as the dependency burden on the labor force. The percentage of adult life in the United States now spent in retirement has increased considerably from 7 percent in 1940 to 26 percent today (assuming adulthood begins at age 20 years, people live the average life expectancy at age 20, and retire at the age of early retirement) [18]. In the Soviet Union today, about 25 percent of adult life also is spent in retirement. The Soviet percentage is similar to the United States because earlier Soviet retirement ages are offset by the shorter life expectancy. The Social Security Amendments of 1983 increased U.S. retirement age beginning in 2000, which will help stabilize the ratio of retired to adult life. If improvements in mortality continue in the Soviet Union, then either retirement ages will have to increase or the ratio of retired to adult life will rise also.

Labor Force. In the 1970s, the labor force in both the United States and the Soviet Union grew rapidly. Both labor force growth rates slowed during the 1980s as population growth rates slowed. And in the 1990s, labor force growth is projected to be about half of what it had been in the 1970s (Table 2) [19].

Changes in the size of labor forces are the net changes in the size of the new entrants and retirees, deaths, migration, and the labor force participation rates. Between 1970 and 1980, the U.S. labor force grew rapidly because of increasing new entrants and increasing participation rates [20]. But in the 1990s, estimated U.S. labor force growth rates will be 58 percent less than in the 1970s and 25 percent less than in the 1980s. The slowing growth rate is due to the slowing of both the number of new entrants and the increases in the labor force participation. In a market economy, economic assumptions are important in determining the opportunity cost of not working and, therefore, how many people will join the labor force [21]. But in centrally-planned economies where every adult is expected to work, the size of the labor force has been influenced more by demographic trends than economic ones.

Table 2. Labor force trends in the United States [4] and Soviet Union [9]. (Labor force as percent of total population includes armed forces abroad.)

Variable	Country	1970	1980	1990	2000
Civilian labor force ($x10^6$)	US	82.8	106.9	125.2	141.1
	USSR	122.0	143.2	153.2	167.4
Average annual growth rate (%)	US		2.6	1.6	1.2
	USSR		1.6	0.7	0.9
Civilian labor force participation rate, 16 years and over (%)	US	60.4	63.8	66.6	69.0
	USSR	76.4	74.7	74.2	73.8
Civilian labor force as percent of total population	US	40.4	47.0	50.0	52.6
	USSR	50.3	53.8	52.7	53.7
Armed forces as percent of total labor force	US	2.9	1.9	1.8	1.6
	USSR	2.8	2.8	2.7	2.5

In the 1980s, the Soviet labor force grew at half the annual rate in the 1970s. The slight increase projected for the 1990s is mainly a consequence of the projected increases in the working-age population over that decade. This increase also reflects the joint impact of the projected increase in new entrants and the decline in new pensioners from 1995 to 2000 (Figure 1B).

U.S. participation rates have increased 5 percentage points since 1970, and the Soviet rates have declined slightly. But the ratio of the civilian labor force to the total population is not likely to change much in either the United States or the Soviet Union. The U.S. labor force, relative to the total population, has grown from 40 percent in 1970 to 50 percent in 1990. But the future rate of increase is expected to slow. In the Soviet Union, the labor force relative to the total population has changed very little since 1980.

High labor force mortality rates exacerbate labor shortages. This effect can be quantified by measuring the expected years of life spent in the labor force given current labor force participation rates and age-specific mortality rates. Today, the expected number of working years of U.S. and Soviet men are similar. Soviet workers have higher labor force participation rates than U.S. workers, but that is offset by higher mortality rates. If Soviet male mortality rates were reduced to the U.S. level in 1985, their average number of work years would increase by 2 years before reaching retirement age and 3 more years after reaching 60 years of age. Soviet female working life, including post-pension-age work, would be 2 years longer if Soviet mortality declined to the U.S. level. Recent Soviet initiatives to extend the coverage and quality of health services, therefore, offer the prospect for significant economic, as well as human, benefits.

Future increases in living standards in the two countries will come more from increased economic productivity of the civilian labor force than from a change in the ratio of the civilian labor force to the total population [22].

Labor productivity can be improved by increasing the capital-labor ratio and by investing in "human capital" through education and health programs. Since World War II, both the United States and the Soviet Union have increased considerably the educational attainment of their populations. The Soviet achievement has been more striking because they began with lower levels of education. Today the Soviets have a higher estimated percentage of their 25 to 29 year olds that have finished high school (98 percent) than in the United States (86 percent). The United States has a higher percentage of college graduates among this age group, but the Soviet Union is increasing the percentage of college graduates faster [23].

The productivity of the labor force depends not only on the educational attainment of its new entrants, but also on the educational attainment of the rest of the population. This is more difficult to calculate; but estimates of total educational attainment suggest that 76 percent of U.S. adults over age 25 years have finished high school compared to 52 percent in the Soviet Union. Continued improvements in human capital as represented by educational attainment will be an important substitute for increasing numbers of human beings in slow-growing labor forces.

Market Adjustments and Soviet Perestroyka. In both countries, changes in the size of age groups in general tend to produce successive fluctuations in demand for different goods and services, leading to alternating periods of shortages and excess capacity. And aging populations in the United States and Soviet Union, in particular, will tend to create fiscal pressures for their income support and health care [24]. (Average official pensions in the Soviet Union are 39 percent of average wages; Social Security benefits in the United States are about 42 percent of average wages.) But, slowing labor force growth is likely to have other economic effects that are more specific to the economies of each country.

In a market economy, the change in one factor such as labor supply will tend to cause some automatic adjustments in the rest of the economy. A slowing U.S. labor force growth might raise the capital-labor ratio, capital-output ratio, and GNP per capita relative to the recent past [25]. It also may lower unemployment rates and increase per capita wages because earnings tend to vary inversely with cohort size in the short-run [26]. But increasing wages also may cause inflation if marginal productivity does not increase proportionately. One almost certain effect of decreasing labor force growth in a healthy economy will be the increasing difficulty in finding young workers to fill jobs [27].

In the Soviet Union, the effect of slowing labor force growth will depend more on government responses than market ones. Slowing labor force growth could help reduce the areas of labor "surplus," such as in Central Asia, and the inevitable underemployment that exists when every adult is guaranteed a job [28]. Decreasing labor force growth is likely to reduce jobs in manual labor and elimination of redundant jobs in industry and services. Some of the European republics of the Soviet Union already are experiencing regional labor shortages, and non-agricultural workers are drawn out of production and into agriculture during peak seasons [29]. In Central Asia, however, the agricultural labor force has been growing, decreasing labor

productivity improvements. Decreasing population growth rates, therefore, are likely to affect the republics in the Soviet Union quite differently.

The most important Soviet government action is likely to be the promised reforms under perestroyka. While a number of reforms already have been instituted, a wider economic reform has been deferred because of political concerns about inflation and unemployment. Slowing labor force growth will ease the impact of unemployment. In fact, in the next 3 years, from 1990 to 1993, the size of the annual increments to the labor force will be smaller than the annual increments in the next 20 years. Therefore, the next 3 years offers the best opportunity for 20 years to minimize the effects of unemployment in a restructuring of the Soviet Union from centrally-planned economy to one more responsive to market forces.

Conclusion

The United States and the Soviet Union both are demographically mature societies that are now facing the inexorable aging of their populations and slowing of their labor force growth. Yet both countries expect their economies to grow in real terms and their standard of living to rise. The combination of their demographic realities and their economic expectations is likely to result in labor constraints, both in the last decade of the 20th century and the first decade of the 21st century.

Labor shortages, in fact, can be opportunities to reduce unemployment and discrimination in each society. But if the shortages persist, then they may affect economic growth unless compensating changes are made in the society. Some of the possible compensating changes have been discussed above. The labor constraints are likely to be more challenging than binding. And the flexibility and public policies of each society will determine how well each country adjusts to the future changes in its populations.

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